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MEMORANDUM

DATE: June 8, 2015

TO: Eric Nuchims, Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-4 Chemist, E & E, Seattle, Washington MW

SUBJ: **Organic Data Quality Assurance Review, John Day Vapor Response Site, John Day, Oregon**

REF: TDD: 15-05-0005 PAN: 1004530.0004.111.02

The data quality assurance review of three water samples collected from the John Day Vapor Response site in John Day, Oregon, has been completed. Semivolatile Organic Compound (SVOC) analysis (EPA Method 8270) was performed by TestAmerica, Inc., Tacoma, Washington. All sample analyses were evaluated following EPA's Stage 2B and/or 4 Data Validation Electronic and/or Manual Process (S2B/4VE/M).

The samples were numbered: 15053101 15053102 15053103

Data Qualifications:

1. Sample Holding Times: Acceptable.

The samples were maintained and received within the QC limits of < 6°C. The samples were collected on May 28 or 29, 2015, were extracted on May 31, 2015, and were analyzed on June 2, 2015, therefore meeting holding time criteria of less than 7 days between collection and extraction and less than 40 days between extraction and analysis.

2. Tuning: Acceptable.

Tuning was performed at the beginning of each 12-hour analysis sequence. All results were within QC limits.

3. Initial Calibration: Acceptable.

All average Relative Response Factors (RRFs) were within the QC limits. All Relative Standard Deviations (RSDs) were within the QC limits.

4. Continuing Calibration: Satisfactory.

All RRFs were within the QC limits. All % differences were within the QC limits except the SMC terphenyl-d14 (no action was taken based on this outlier as all SMC sample recoveries were within QC limits) and hexachlorocyclopentadiene with a high recovery (associated positive results were qualified as estimated quantities with a high bias [JH]).

5. Blanks: Satisfactory.

A method blank was analyzed for each 20 sample batch per matrix. There were no detections in any method blank except diethyl phthalate (0.129 µg/L), di-n-butyl phthalate (0.226 µg/L), butyl benzyl phthalate (0.308 µg/L), and di-n-octyl phthalate (0.196 µg/L). Associated sample results less than 5 times the blank contamination were qualified as not detected (U).

6. System Monitoring Compounds (SMCs): Satisfactory.

All SMC recoveries were within QC limits except nitrobenzene in sample 15053103 with a high recovery. Positive results associated with the high recovery outlier were qualified as estimated quantities with a high bias (JH).

7. Blank Spike (BS)/Blank Spike Duplicate (BSD) Analysis: Satisfactory.

All spike analyses were performed per SDG or per matrix per concentration level, whichever was more frequent. All recoveries were within the QC limits except 4-chloroaniline with low recoveries and bis(2-ethylhexyl)phthalate with a high recovery. Associated 4-chloroaniline positive results and sample quantitation limits were qualified as estimated quantities with a low bias (JL or UJL). No actions were taken based on the high recovery outlier as it was not detected in any samples.

8. Duplicate Analysis: Satisfactory.

Blank spike duplicate analysis was performed per SDG or per matrix per concentration level, whichever was more frequent. All spike duplicate results were within QC limits except hexachloroethane, 4-chloroaniline, hexachlorobutadiene, 3-nitroaniline, 3,3'-dichlorobenzidine, and bis(2-ethylhexyl) phthalate. Associated positive results were qualified as estimated quantities with an unknown bias (JK).

9. Internal Standards: Acceptable.

All internal standards (IS) were within $\pm$ 30 seconds of the continuing calibration IS retention times. All area counts were within 50 % to 200 % of the continuing calibration area counts.

10. Precision and Bias Determination: Not Performed.

Samples necessary to determine precision and bias were not provided to the laboratory. All results were flagged "PND" (Precision Not Determined) and "RND" (Recovery Not Determined), although the flags do not appear on the data sheets.

11. Performance Evaluation Sample Analysis: Not Provided.

Performance evaluation samples were not provided to the laboratory.

12. Overall Assessment of Data for Use

Fluoranthene (samples 15053101 and 15053102) and phenanthrene (sample 15053101) were qualified as not detected (U) based on rinsate blank results.

The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), the analytical method, and, when applicable, the Office of Emergency and Remedial Response Publication "USEPA Contract Laboratory Program National Functional

Guidelines for Organic Data Review". Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

JH - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample with a high bias.

JL - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample with a low bias.

JK - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample with an unknown direction of bias.

JQ – The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample with an unknown direction of bias and falls between the MDL and the Minimum (or Practical) Quantitation Limit (MQL, PQL).

N - The analysis indicates the present of an analyte for which there is presumptive evidence to make a "tentative identification".

NJ - The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Client Sample ID: **15053101**

Lab Sample ID: 580-50288-1
Client Matrix: Water

Date Sampled: 05/28/2015 1403
Date Received: 05/29/2015 1715

8270D Semivolatile Organic Compounds (GC/MS)

Analysis Method:	8270D	Analysis Batch:	580-190998	Instrument ID:	TAC051
Prep Method:	3520C	Prep Batch:	580-190785	Lab File ID:	0602B017.D
Dilution:	1.0			Initial Weight/Volume:	1024.7 mL
Analysis Date:	06/02/2015 2248			Final Weight/Volume:	2.0 mL
Prep Date:	05/31/2015 1359			Injection Volume:	2 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Phenol	ND		0.098	0.59
Bis(2-chloroethyl)ether	ND		0.098	0.39
2-Chlorophenol	ND		0.098	0.39
1,3-Dichlorobenzene	ND		0.098	0.39
1,4-Dichlorobenzene	ND		0.098	0.39
Benzyl alcohol	ND		0.098	0.39
1,2-Dichlorobenzene	ND		0.098	0.39
2-Methylphenol	ND		0.098	0.39
3 & 4 Methylphenol	ND		0.098	0.78
N-Nitrosodi-n-propylamine	ND		0.098	0.39
Hexachloroethane	ND		0.098	0.59
Nitrobenzene	ND		0.098	0.39
Isophorone	ND		0.098	0.39
2-Nitrophenol	ND		0.098	0.39
2,4-Dimethylphenol	ND		0.29	2.0
Benzoic acid	ND		0.59	2.9
Bis(2-chloroethoxy)methane	ND		0.098	0.39
2,4-Dichlorophenol	ND		0.098	0.39
1,2,4-Trichlorobenzene	ND		0.098	0.39
Naphthalene	ND		0.098	0.39
4-Chloroaniline	ND	*	0.098	0.39
Hexachlorobutadiene	ND	*	0.098	0.59
4-Chloro-3-methylphenol	ND		0.098	0.39
2-Methylnaphthalene	ND		0.020	0.20
Hexachlorocyclopentadiene	ND	^	0.098	2.0
2,4,6-Trichlorophenol	ND		0.098	0.59
2,4,5-Trichlorophenol	ND		0.098	0.39
2-Chloronaphthalene	ND		0.020	0.059
2-Nitroaniline	ND		0.098	0.39
Dimethyl phthalate	0.64		0.098	0.39
Acenaphthylene	ND		0.020	0.078
2,6-Dinitrotoluene	1.1		0.098	0.39
3-Nitroaniline	ND	*	0.12	0.39
Acenaphthene	ND		0.020	0.098
2,4-Dinitrophenol	ND		0.98	4.9
4-Nitrophenol	ND		0.98	2.9
Dibenzofuran	ND		0.098	0.39
2,4-Dinitrotoluene	ND		0.098	0.39
Diethyl phthalate	0.65	B	0.098	0.39
4-Chlorophenyl phenyl ether	ND		0.098	0.39
Fluorene	ND		0.020	0.059
4-Nitroaniline	ND		0.098	0.59
4,6-Dinitro-2-methylphenol	ND		0.98	3.9
N-Nitrosodiphenylamine	ND		0.098	0.39
4-Bromophenyl phenyl ether	ND		0.098	0.39
Hexachlorobenzene	ND		0.098	0.39

Client: Ecology and Environment, Inc.

Job Number: 580-50288-1

Client Sample ID: 15053101

Lab Sample ID: 580-50288-1
Client Matrix: Water

Date Sampled: 05/28/2015 1403
Date Received: 05/29/2015 1715

8270D Semivolatile Organic Compounds (GC/MS)

Analysis Method:	8270D	Analysis Batch:	580-190998	Instrument ID:	TAC051
Prep Method:	3520C	Prep Batch:	580-190785	Lab File ID:	0602B017.D
Dilution:	1.0			Initial Weight/Volume:	1024.7 mL
Analysis Date:	06/02/2015 2248			Final Weight/Volume:	2.0 mL
Prep Date:	05/31/2015 1359			Injection Volume:	2 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Pentachlorophenol	ND		0.098	0.68
Phenanthrene	ND		0.020	0.078
Anthracene	ND		0.0098	0.039
Di-n-butyl phthalate	0.33	J	0.13	0.39
Fluoranthene	0.020	J	0.013	0.049
Pyrene	0.014	J	0.013	0.059
Butyl benzyl phthalate	0.32	J	0.20	0.59
3,3'-Dichlorobenzidine	ND		0.098	2.0
Benzo[a]anthracene	ND		0.020	0.059
Chrysene	ND		0.013	0.039
Bis(2-ethylhexyl) phthalate	ND		1.2	2.9
Di-n-octyl phthalate	ND		0.18	0.39
Benzo[a]pyrene	ND		0.020	0.039
Indeno[1,2,3-cd]pyrene	ND		0.020	0.059
Dibenz(a,h)anthracene	ND		0.020	0.059
Benzo[g,h,i]perylene	ND		0.020	0.059
Carbazole	ND		0.098	0.39
1-Methylnaphthalene	ND		0.029	0.059
Benzo[b]fluoranthene	ND		0.020	0.078
Benzo[k]fluoranthene	ND		0.020	0.059
bis(chloroisopropyl) ether	ND		0.098	0.39

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol (Surr)	77		30 - 134
Phenol-d5 (Surr)	91		52 - 120
Nitrobenzene-d5 (Surr)	83		59 - 120
2-Fluorobiphenyl	77		50 - 120
2,4,6-Tribromophenol (Surr)	108		44 - 125
Terphenyl-d14 (Surr)	106		64 - 150

Client: Ecology and Environment, Inc. Job Number: 580-50288-1

Client Sample ID: 15053102

Lab Sample ID: 580-50288-2
Client Matrix: Water

Date Sampled: 05/28/2015 1610
Date Received: 05/29/2015 1715

8270D Semivolatile Organic Compounds (GC/MS)

Analysis Method:	8270D	Analysis Batch:	580-190998	Instrument ID:	TAC051
Prep Method:	3520C	Prep Batch:	580-190785	Lab File ID:	0602B018.D
Dilution:	1.0			Initial Weight/Volume:	1054.2 mL
Analysis Date:	06/02/2015 2313			Final Weight/Volume:	2.0 mL
Prep Date:	05/31/2015 1359			Injection Volume:	2 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Phenol	ND		0.095	0.57
Bis(2-chloroethyl)ether	ND		0.095	0.38
2-Chlorophenol	ND		0.095	0.38
1,3-Dichlorobenzene	ND		0.095	0.38
1,4-Dichlorobenzene	ND		0.095	0.38
Benzyl alcohol	ND		0.095	0.38
1,2-Dichlorobenzene	ND		0.095	0.38
2-Methylphenol	ND		0.095	0.38
3 & 4 Methylphenol	ND		0.095	0.76
N-Nitrosodi-n-propylamine	ND		0.095	0.38
Hexachloroethane	ND		0.095	0.57
Nitrobenzene	ND		0.095	0.38
Isophorone	ND		0.095	0.38
2-Nitrophenol	ND		0.095	0.38
2,4-Dimethylphenol	ND		0.28	1.9
Benzoic acid	0.68	J	0.57	2.8
Bis(2-chloroethoxy)methane	ND		0.095	0.38
2,4-Dichlorophenol	ND		0.095	0.38
1,2,4-Trichlorobenzene	ND		0.095	0.38
Naphthalene	ND		0.095	0.38
4-Chloroaniline	ND		0.095	0.38
Hexachlorobutadiene	ND		0.095	0.57
4-Chloro-3-methylphenol	ND		0.095	0.38
2-Methylnaphthalene	ND		0.019	0.19
Hexachlorocyclopentadiene	ND		0.095	1.9
2,4,6-Trichlorophenol	ND		0.095	0.57
2,4,5-Trichlorophenol	ND		0.095	0.38
2-Chloronaphthalene	ND		0.019	0.057
2-Nitroaniline	ND		0.095	0.38
Dimethyl phthalate	0.13	J	0.095	0.38
Acenaphthylene	ND		0.019	0.076
2,6-Dinitrotoluene	0.57		0.095	0.38
3-Nitroaniline	ND		0.11	0.38
Acenaphthene	ND		0.019	0.095
2,4-Dinitrophenol	ND		0.95	4.7
4-Nitrophenol	ND		0.95	2.8
Dibenzofuran	ND		0.095	0.38
2,4-Dinitrotoluene	ND		0.095	0.38
Diethyl phthalate	~~0.21~~	~~J~~	0.095	0.38
4-Chlorophenyl phenyl ether	ND		0.095	0.38
Fluorene	ND		0.019	0.057
4-Nitroaniline	ND		0.095	0.57
4,6-Dinitro-2-methylphenol	ND		0.95	3.8
N-Nitrosodiphenylamine	ND		0.095	0.38
4-Bromophenyl phenyl ether	ND		0.095	0.38
Hexachlorobenzene	ND		0.095	0.38

Client: Ecology and Environment, Inc.

Job Number: 580-50288-1

Client Sample ID: 15053102

Lab Sample ID: 580-50288-2
Client Matrix: Water

Date Sampled: 05/28/2015 1610
Date Received: 05/29/2015 1715

8270D Semivolatile Organic Compounds (GC/MS)

Analysis Method:	8270D	Analysis Batch:	580-190998	Instrument ID:	TAC051
Prep Method:	3520C	Prep Batch:	580-190785	Lab File ID:	0602B018.D
Dilution:	1.0			Initial Weight/Volume:	1054.2 mL
Analysis Date:	06/02/2015 2313			Final Weight/Volume:	2.0 mL
Prep Date:	05/31/2015 1359			Injection Volume:	2 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Pentachlorophenol	ND		0.095	0.66
Phenanthrene	ND		0.019	0.076
Anthracene	ND		0.0095	0.038
Di-n-butyl phthalate	~~0.25~~	J	0.12	0.38
Fluoranthene	~~0.015~~	J	0.012	0.047
Pyrene	ND		0.012	0.057
Butyl benzyl phthalate	~~0.31~~	J	0.19	0.57
3,3'-Dichlorobenzidine	ND		0.095	1.9
Benzo[a]anthracene	ND		0.019	0.057
Chrysene	ND		0.012	0.038
Bis(2-ethylhexyl) phthalate	ND		1.1	2.8
Di-n-octyl phthalate	~~0.18~~	J	0.17	0.38
Benzo[a]pyrene	ND		0.019	0.038
Indeno[1,2,3-cd]pyrene	ND		0.019	0.057
Dibenz(a,h)anthracene	ND		0.019	0.057
Benzo[g,h,i]perylene	ND		0.019	0.057
Carbazole	ND		0.095	0.38
1-Methylnaphthalene	ND		0.028	0.057
Benzo[b]fluoranthene	ND		0.019	0.076
Benzo[k]fluoranthene	ND		0.019	0.057
bis(chloroisopropyl) ether	ND		0.095	0.38

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol (Surr)	72		30 - 134
Phenol-d5 (Surr)	85		52 - 120
Nitrobenzene-d5 (Surr)	90		59 - 120
2-Fluorobiphenyl	81		50 - 120
2,4,6-Tribromophenol (Surr)	94		44 - 125
Terphenyl-d14 (Surr)	110		64 - 150

Client: Ecology and Environment, Inc.

Job Number: 580-50288-1

Client Sample ID: 15053103

Lab Sample ID: 580-50288-3
Client Matrix: Water

Date Sampled: 05/29/2015 0940
Date Received: 05/29/2015 1715

8270D Semivolatile Organic Compounds (GC/MS)

Analysis Method:	8270D	Analysis Batch:	580-190998	Instrument ID:	TAC051
Prep Method:	3520C	Prep Batch:	580-190785	Lab File ID:	0602B019.D
Dilution:	10			Initial Weight/Volume:	1038.7 mL
Analysis Date:	06/02/2015 2338			Final Weight/Volume:	2.0 mL
Prep Date:	05/31/2015 1359			Injection Volume:	2 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Phenol	7.5 JH		0.96	5.8
Bis(2-chloroethyl)ether	ND		0.96	3.9 U
2-Chlorophenol	ND		0.96	3.9
1,3-Dichlorobenzene	ND		0.96	3.9
1,4-Dichlorobenzene	ND		0.96	3.9
Benzyl alcohol	ND		0.96	3.9
1,2-Dichlorobenzene	ND		0.96	3.9
2-Methylphenol	27 JH		0.96	3.9
3 & 4 Methylphenol	18 JH		0.96	7.7
N-Nitrosodi-n-propylamine	ND		0.96	3.9 U
Hexachloroethane	ND		0.96	5.8
Nitrobenzene	ND		0.96	3.9
Isophorone	ND		0.96	3.9
2-Nitrophenol	ND		0.96	3.9
2,4-Dimethylphenol	38 JH		2.9	19
Benzoic acid	ND		5.8	29 U
Bis(2-chloroethoxy)methane	ND		0.96	3.9
2,4-Dichlorophenol	ND		0.96	3.9
1,2,4-Trichlorobenzene	ND		0.96	3.9
Naphthalene	51 JH		0.96	3.9
4-Chloroaniline	ND		0.96	3.9 UJL
Hexachlorobutadiene	ND		0.96	5.8
4-Chloro-3-methylphenol	ND		0.96	3.9
2-Methylnaphthalene	65 JH		0.19	1.9
Hexachlorocyclopentadiene	ND		0.96	19 U
2,4,6-Trichlorophenol	ND		0.96	5.8
2,4,5-Trichlorophenol	ND		0.96	3.9
2-Chloronaphthalene	ND		0.19	0.58
2-Nitroaniline	ND		0.96	3.9
Dimethyl phthalate	ND		0.96	3.9
Acenaphthylene	ND		0.19	0.77
2,6-Dinitrotoluene	ND		0.96	3.9
3-Nitroaniline	ND		1.2	3.9
Acenaphthene	1.1 JH		0.19	0.96
2,4-Dinitrophenol	ND		9.6	48 U
4-Nitrophenol	ND		9.6	29 U
Dibenzofuran	1.6	J Q	0.96	3.9
2,4-Dinitrotoluene	ND		0.96	3.9 U
Diethyl phthalate	ND		0.96	3.9
4-Chlorophenyl phenyl ether	ND		0.96	3.9
Fluorene	2.9 JH		0.19	0.58
4-Nitroaniline	ND		0.96	5.8 U
4,6-Dinitro-2-methylphenol	ND		9.6	39 U
N-Nitrosodiphenylamine	2.0	J Q	0.96	3.9
4-Bromophenyl phenyl ether	ND		0.96	3.9 U
Hexachlorobenzene	ND		0.96	3.9 U

Client: Ecology and Environment, Inc.

Job Number: 580-50288-1

Client Sample ID: 15053103

Lab Sample ID: 580-50288-3
Client Matrix: Water

Date Sampled: 05/29/2015 0940
Date Received: 05/29/2015 1715

8270D Semivolatile Organic Compounds (GC/MS)

Analysis Method:	8270D	Analysis Batch:	580-190998	Instrument ID:	TAC051
Prep Method:	3520C	Prep Batch:	580-190785	Lab File ID:	0602B019.D
Dilution:	10			Initial Weight/Volume:	1038.7 mL
Analysis Date:	06/02/2015 2338			Final Weight/Volume:	2.0 mL
Prep Date:	05/31/2015 1359			Injection Volume:	2 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Pentachlorophenol	ND		0.96	6.7 U
Phenanthrene	3.9 JH		0.19	0.77
Anthracene	0.38	J Q	0.096	0.39
Di-n-butyl phthalate	ND		1.3	3.9 U
Fluoranthene	ND		0.13	0.48 U
Pyrene	0.87 JH		0.13	0.58
Butyl benzyl phthalate	ND		1.9	5.8 U
3,3'-Dichlorobenzidine	ND		0.96	19
Benzo[a]anthracene	ND		0.19	0.58
Chrysene	ND		0.13	0.39
Bis(2-ethylhexyl) phthalate	ND		11	29
Di-n-octyl phthalate	ND		1.7	3.9
Benzo[a]pyrene	ND		0.19	0.39
Indeno[1,2,3-cd]pyrene	ND		0.19	0.58
Dibenz(a,h)anthracene	ND		0.19	0.58
Benzo[g,h,i]perylene	ND		0.19	0.58
Carbazole	1.2	J Q	0.96	3.9
1-Methylnaphthalene	47 JH		0.29	0.58
Benzo[b]fluoranthene	ND		0.19	0.77 U
Benzo[k]fluoranthene	ND		0.19	0.58
bis(chloroisopropyl) ether	ND		0.96	3.9

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol (Surr)	82		30 - 134
Phenol-d5 (Surr)	99		52 - 120
Nitrobenzene-d5 (Surr)	144	X	59 - 120
2-Fluorobiphenyl	96		50 - 120
2,4,6-Tribromophenol (Surr)	125		44 - 125
Terphenyl-d14 (Surr)	149		64 - 150

6-8-15